

Project ENVVEST Technical Update

Introduction

Schedule

Status of Technical Studies

Water Quality Monitoring

Biota Sampling

Current Meter Deployment

Fecal Coliform Modeling Results

**Dr. Robert K. Johnston
ENVVEST Technical Coordinator
Community Advisory Committee Meeting
November 3, 2005**

Project ENVVEST

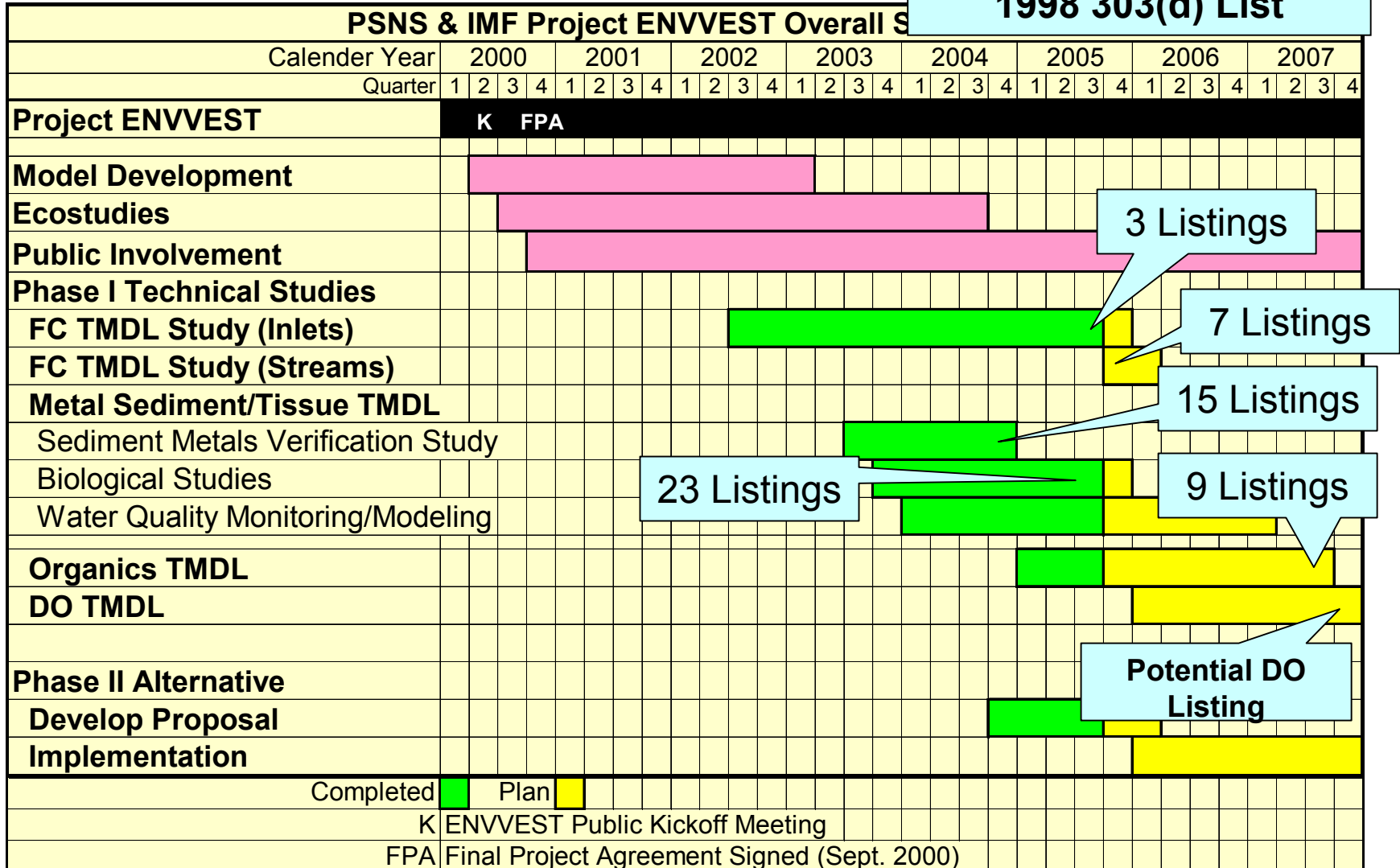
Schedule

PSNS & IMF Project ENVVEST Overall Schedule																																	
Calender Year		2000				2001				2002				2003				2004				2005				2006				2007			
Quarter		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Project ENVVEST		K FPA																															
Model Development																																	
Ecostudies																																	
Public Involvement																																	
Phase I Technical Studies																																	
FC TMDL Study (Inlets)																																	
FC TMDL Study (Streams)																																	
Metal Sediment/Tissue TMDL																																	
Sediment Metals Verification Study																																	
Biological Studies																																	
Water Quality Monitoring/Modeling																																	
Organics TMDL																																	
DO TMDL																																	
Phase II Alternative																																	
Develop Proposal																																	
Implementation																																	
Completed																																	
Plan																																	
K ENVVEST Public Kickoff Meeting																																	
FPA Final Project Agreement Signed (Sept. 2000)																																	

Project ENVVEST

Schedule

Number of Listings on
1998 303(d) List



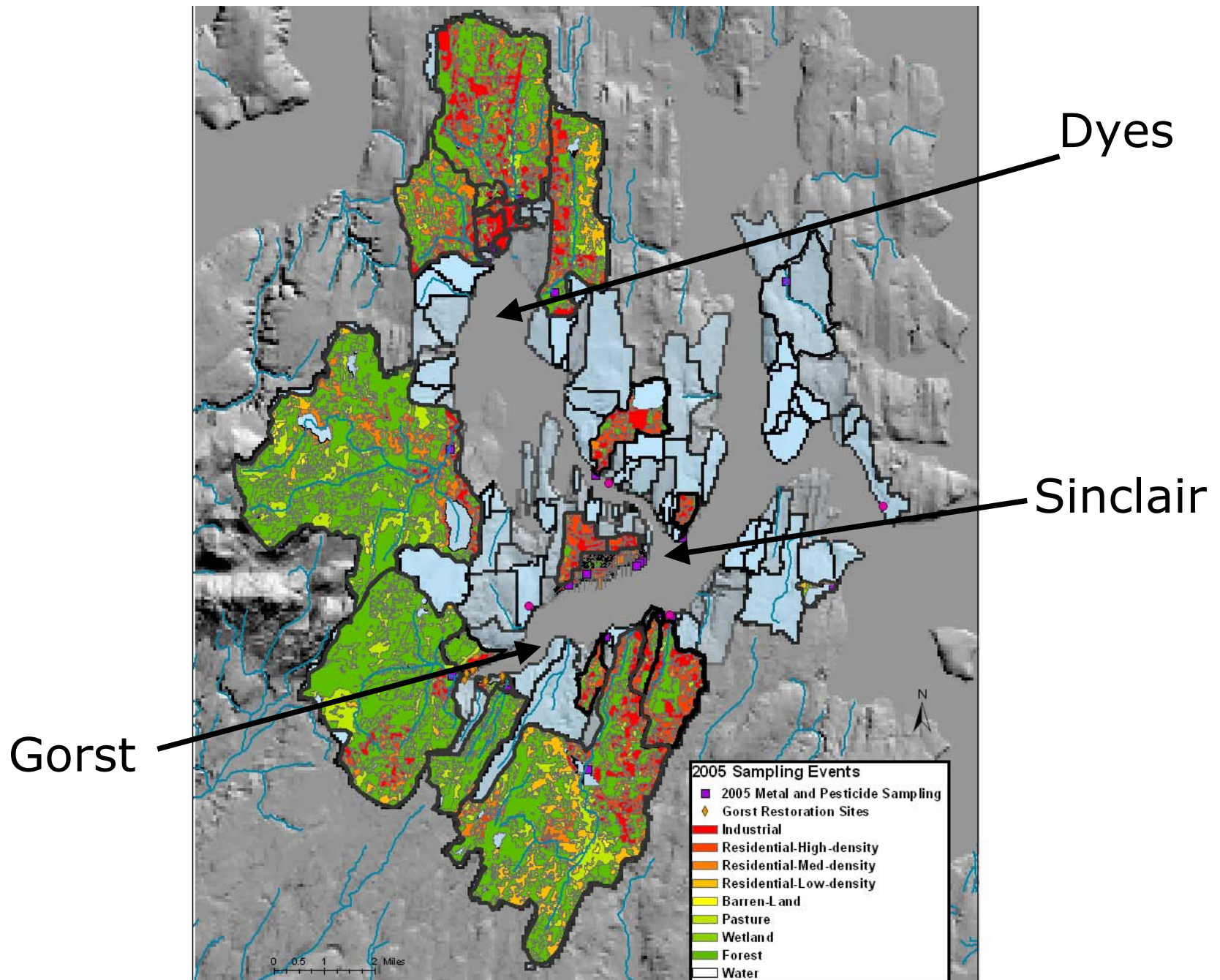
Status of Technical Studies

Water Quality Monitoring Objectives:

Monitor water quality in streams, storm water, and marine waters during storm and non-storm events

Obtain data needed for total loading and modeling analysis of metals, toxic organics, and nutrients

Watersheds with flow monitoring sampled in 2005.



Events Sampled

Event	Date	Rainfall
Gorst1	17 Jan 2005	2.2 - 2.5"
Gorst2	22 Jan 2005	0.2 - 0.38"
ENV02	9 Feb 2005	Nonstorm (Winter)
Sinclair1	28 Feb 2005	0.27 - 0.38"
Sinclair2	20 Mar 2005	0.78 - 1.4"
Dyes1	26 Mar 2005	1.3 - 2.25"
Dyes2	31 Mar 2005	0.85 - 1.12"
Baseflow	30 Mar 2005	Nonstorm (Wet Season)
ENV05	20 Jun 2005	Nonstorm (Spring)
ENV06	15 Sep 2005	Nonstorm (Summer)

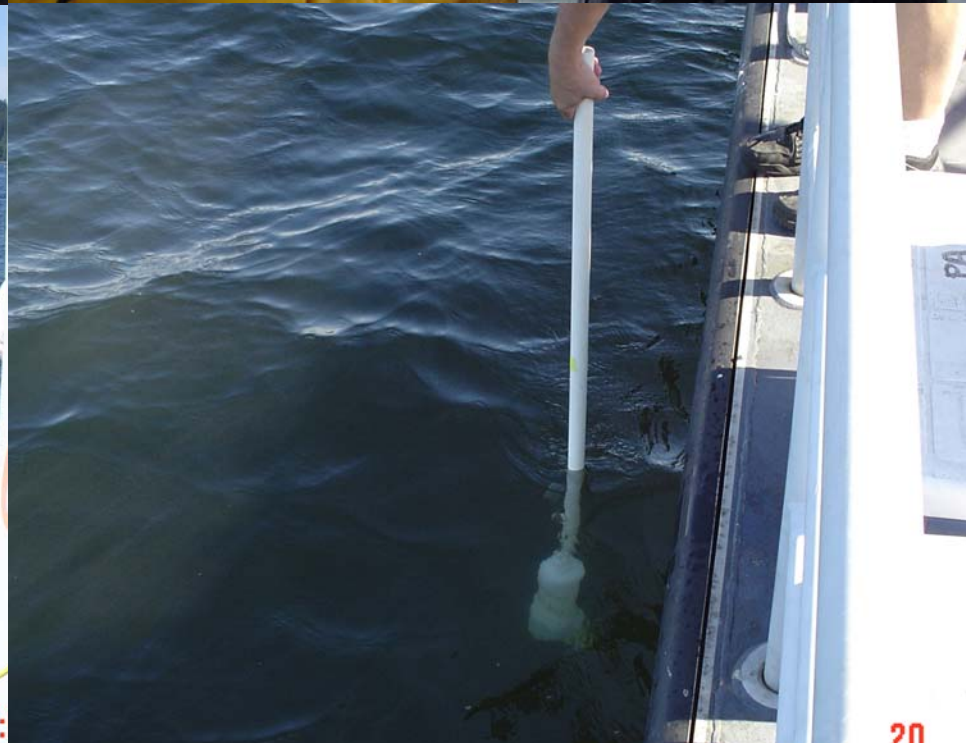
Storm Event Sampling



1.17.2005



Ambient Marine Sampling





Analytes for Storm Event Sampling:

In situ

Temp, pH, conductivity, turbidity

Conventional Parameters

Alkaninty, TS, TSS, grain size, TOC, DOC

Nutrients – NO_3 + NO_2 , NH_3 , TN, TP

Metals

Total - Al, As, Cd, Cr, Cu, Pb, Hg, Ag, Zn

Dissolved – Cd, Cu, Pb, Ag, Zn

Polycyclic Aromatic Hydrocarbons (PAHs)

15 (parent) PAH compounds

Phthalates – 3 compounds

Polychlorinated Biphenyls (PCBs)

20 congeners and Aroclor 1268

Pesticides – Chlorinated, Organo-Phosphorous,
and Nitrogen-based (106 compounds)

Herbicides – 24 compounds

Status of Technical Studies (Cont.)

Biota Sampling

Demersal Fish Sampling

**Sample fish and invertebrates from
Sinclair Inlet and Reference Areas
(May 2005)**

Caged Mussel Study

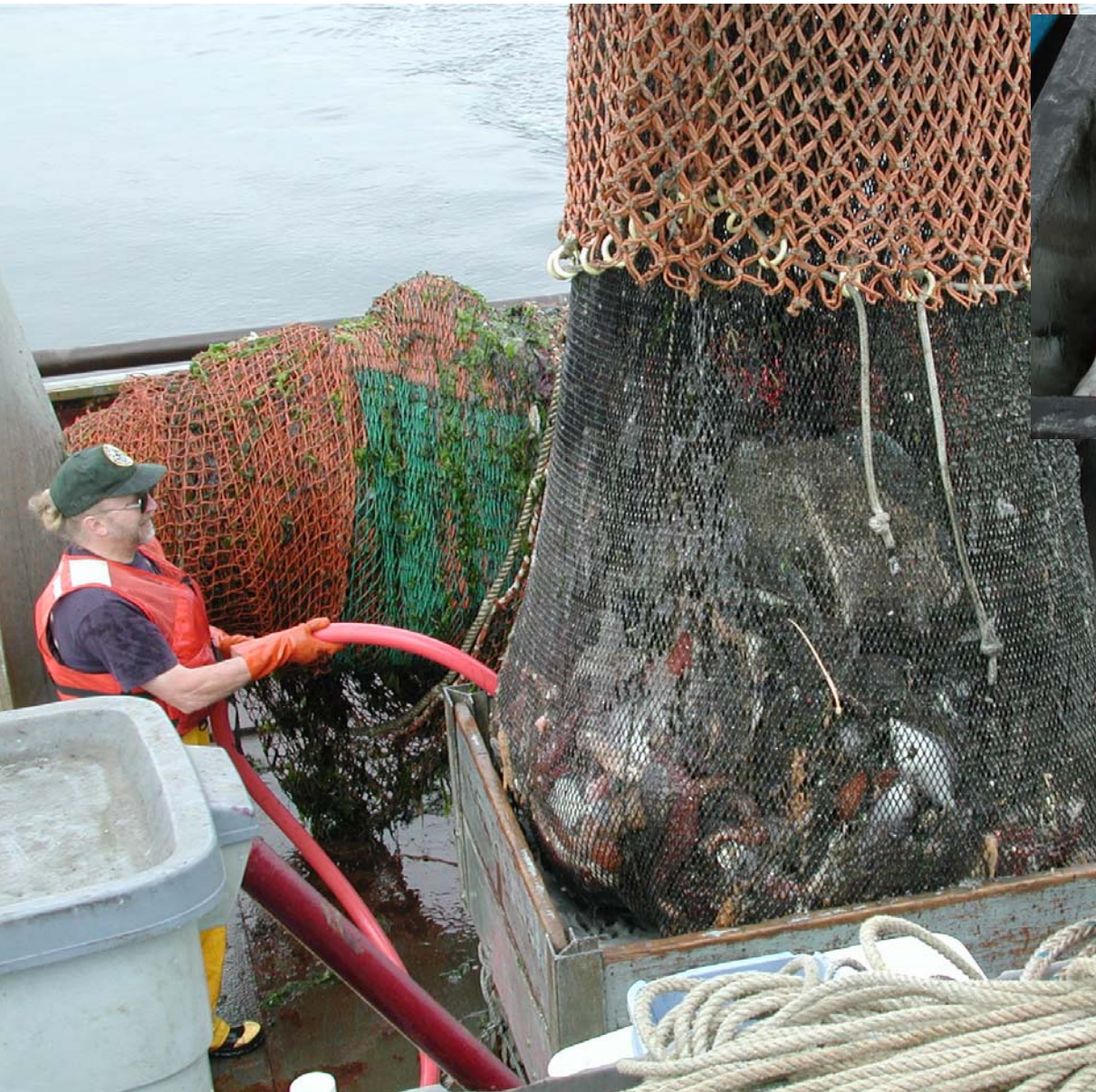
**Deploy caged mussels at selected
locations in Sinclair and Dyes Inlets
for 3 Months (June – Sep 2005)**

Puget Sound Ambient Monitoring



May 2005 Survey
Georgia Strait
Vendovi
Nisqually
Hood Canal
Port Gardner
Sinclair Inlet

Fish Sampling Sinclair Inlet



Caged Mussel Study

Objective:

Deploy caged mussels at seven locations in Sinclair and Dyes Inlets to evaluate potential biological effects from ambient exposures to marine organisms.



Mussel Deployment

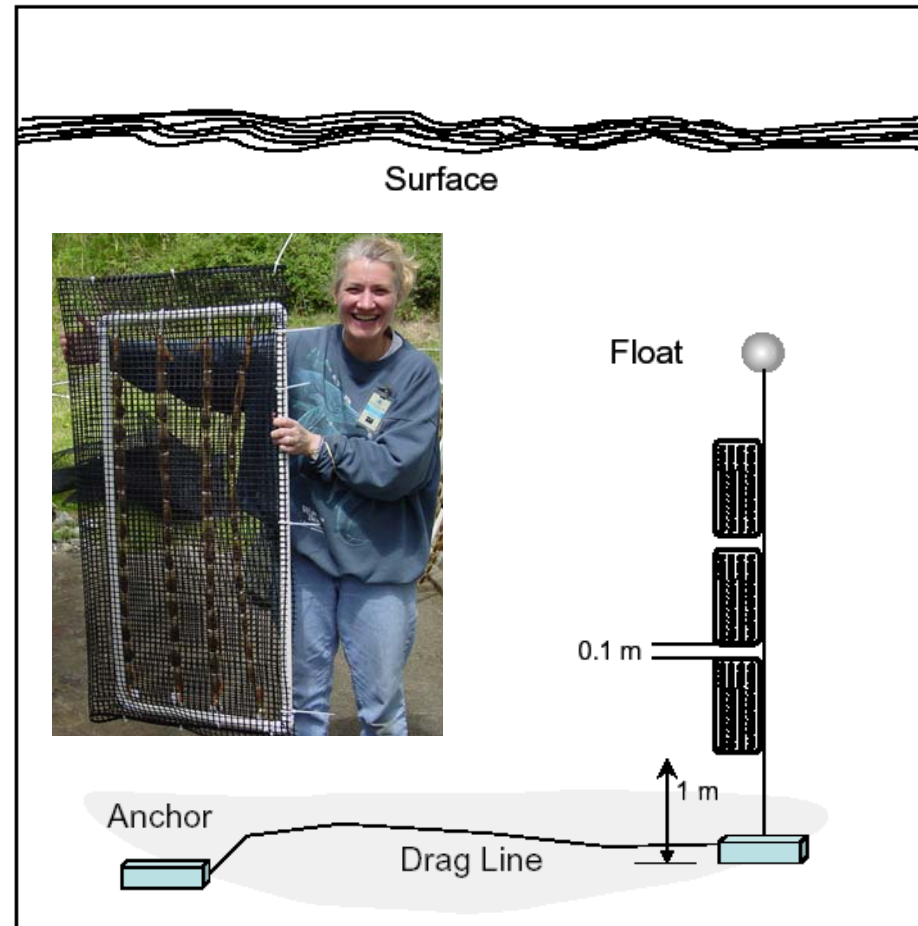
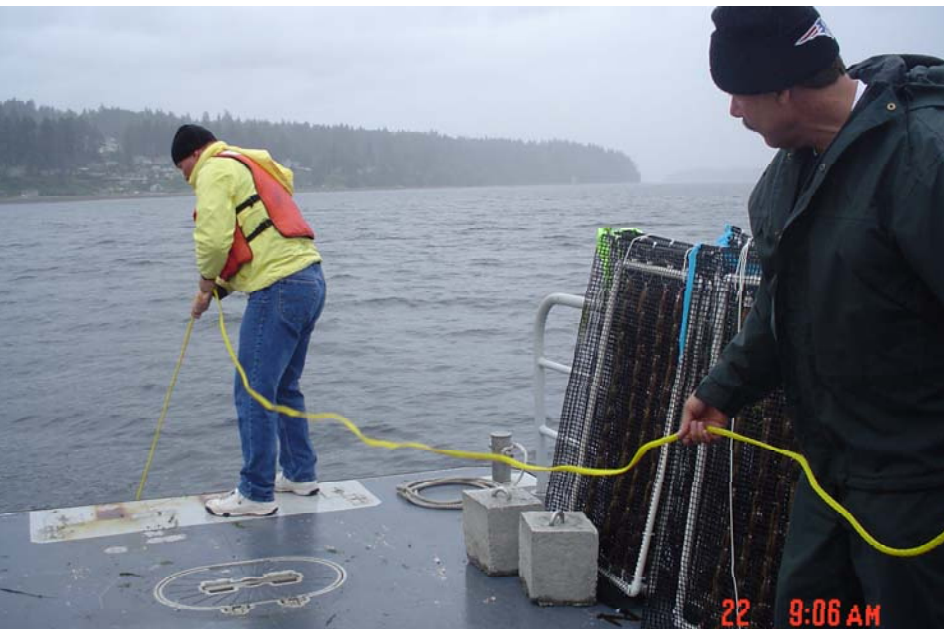
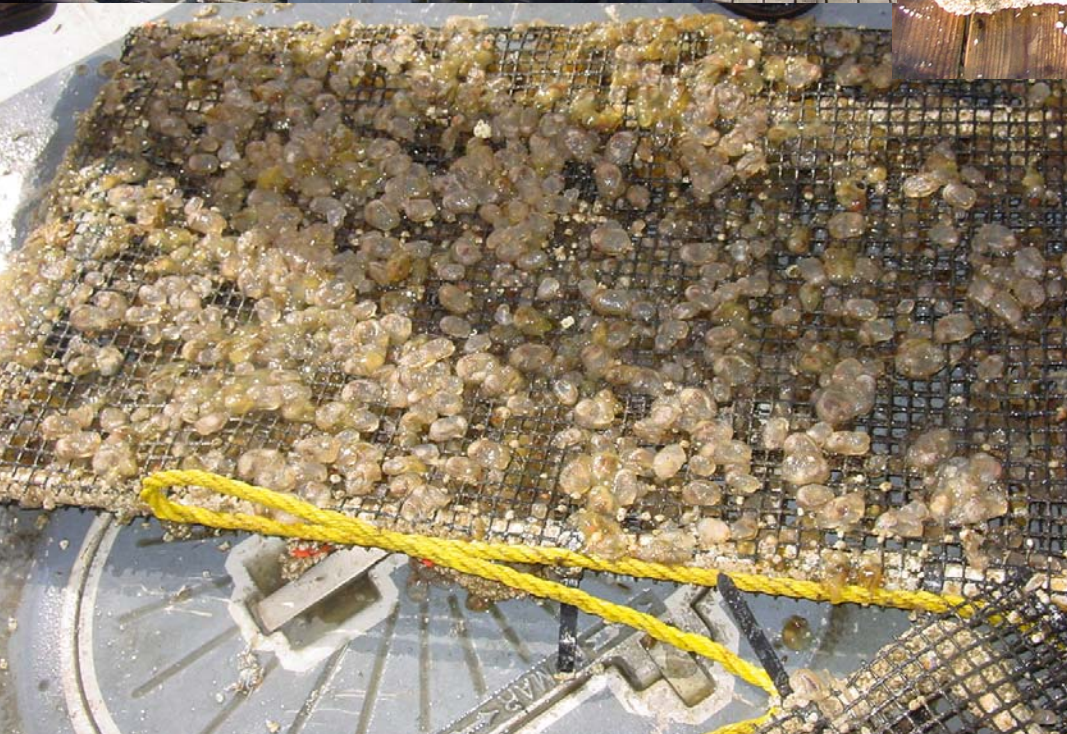


Figure 2. Mussel cage deployment configuration.

Mussel Deployment Stations



Mussel Cage Retrieval



Status of Technical Studies (Cont.)

Current Meter Study

Objective:

Obtain data on currents at selected locations during changing tidal and weather conditions.

Current Meter Locations

Liberty Bay

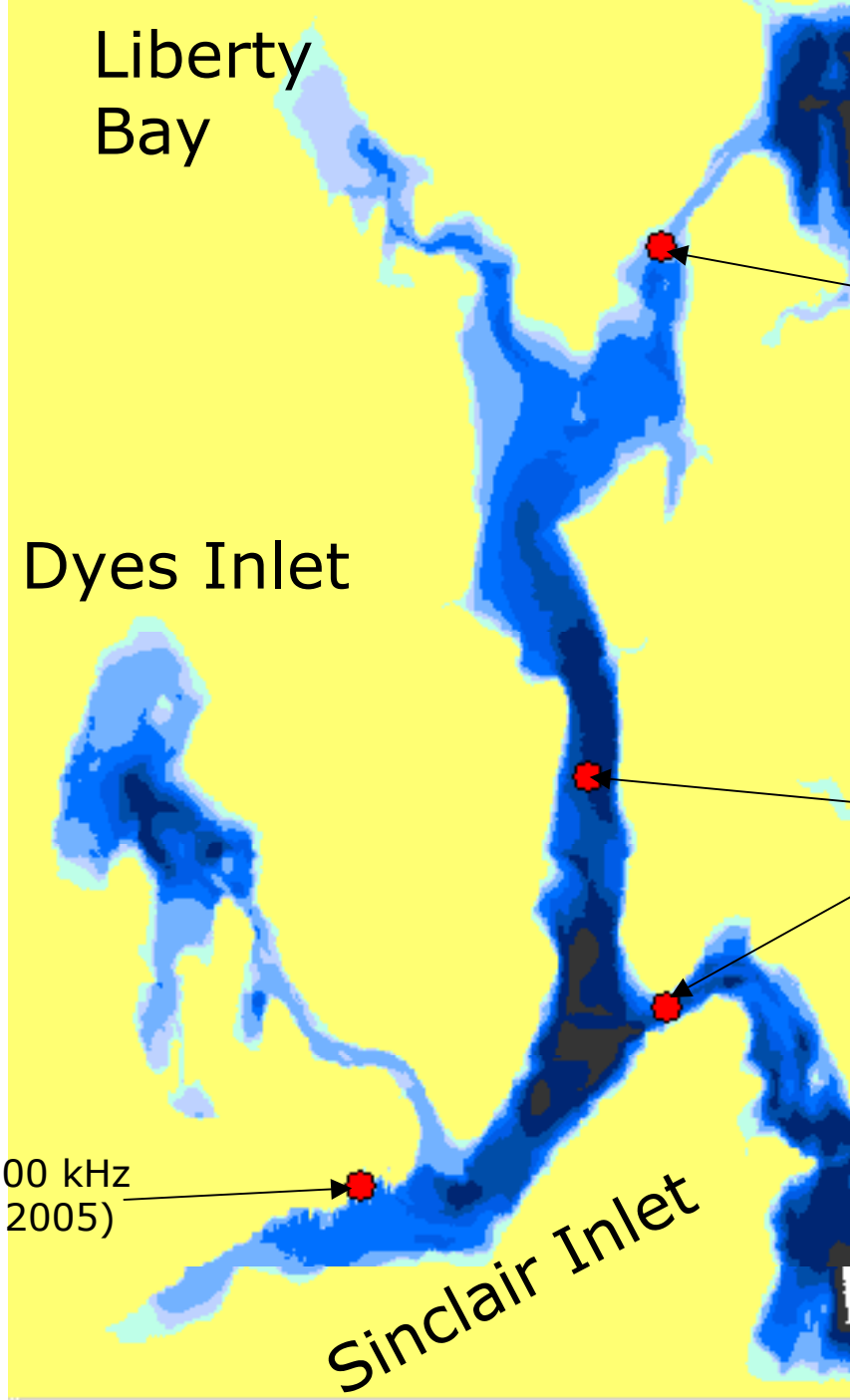
Dyes Inlet

SSC-SD 1200 kHz
(Sep/Oct 2005)

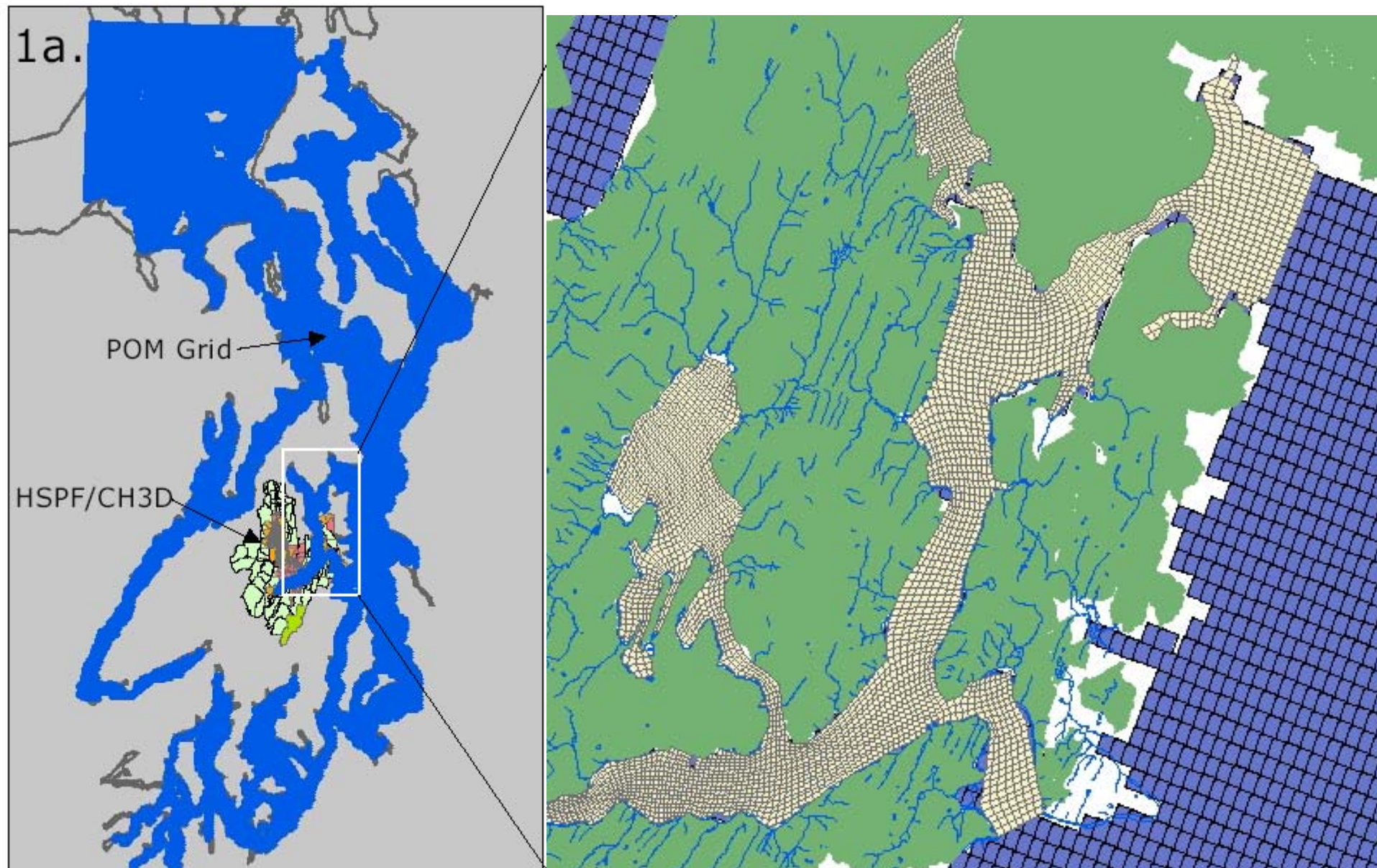
Ecology 300 kHz
(Sep - Dec 2005)

SSC-SD 1200 kHz
(Oct/Nov 2005)

Sinclair Inlet



Linking Models for Sinclair and Dyes Inlets with larger scale Puget Sound Model



Current Meter Deployment



Status of Technical Studies (Cont.)



Storm Event Sampling in the Sinclair and Dyes Inlet Watershed: FY2005 Quality Assurance Project Plan

R.K. Johnston, Ph.D.
Marine Environmental Support Office – Northwest
Space and Naval Warfare Systems Center
Bremerton, WA

J. Brandenberger, MS, C.W. May, Ph.D.,
Battelle Marine Sciences Laboratory
Sequim, WA

V.S. Whitney, MS, J.M. Wright, MS,
and Bruce Beckwith
Puget Sound Naval Shipyard
Bremerton, WA

Ryan Pingree, MS
The Environmental Company
Honolulu, HI

Prepared by
Puget Sound Naval Shipyard & Intermediate Maintenance
Facility Project ENVVEST

For
Washington State Department of Ecology
Assessments Sections

FINAL DRAFT
January 18, 2005

1



Biological Sampling and Analysis in Sinclair and Dyes Inlets, WA FY2005 Quality Assurance Project Plan

R.K. Johnston, Ph.D.
Marine Environmental Support Office – Northwest
Space and Naval Warfare Systems Center
Bremerton, WA

J. Brandenberger, MS, E. Crocelsius, Ph.D.,
Battelle Marine Sciences Laboratory
Sequim, WA

Scott Steinert
CSC Biomarkers Laboratory
Computer Sciences Corporation
San Diego, CA

M.H. Salazar and S.M. Salazar
Applied BioMonitoring
Kirkland, WA

Prepared by
Puget Sound Naval Shipyard & Intermediate
Maintenance Facility Project ENVVEST

For
Washington State Department of Ecology
Assessments Sections



Photo by Greg Williams (PHL-BMSL)

DRAFT
March 31, 2005

1



Current Meter Study for Agate, Port Orchard, and Rich Passages Study Plan



DRAFT
August 29, 2005

Water Body Numbers

WA-15-0030 Port
Orchard, Agate, and
Rich Passages,
WA-15-0040 Sinclair
Inlet
WA-15-0050 Dyes Inlet

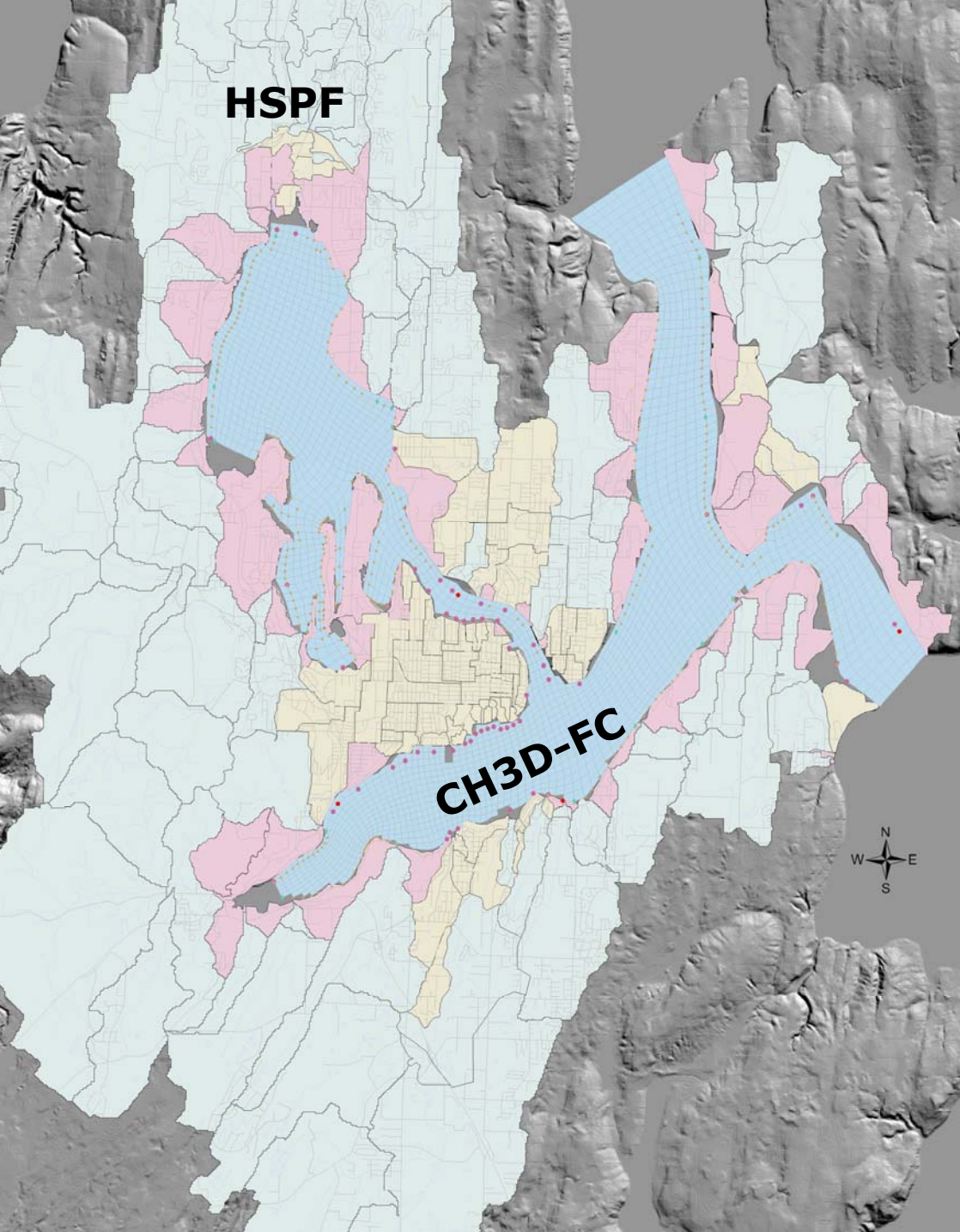
R.K. Johnston, Ph.D.
Marine Environmental Support Office –
Northwest
Space and Naval Warfare Systems Center
Bremerton, WA

Skip Albertson
Environmental Assessment
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Prepared by
Puget Sound Marine Environmental Modeling
A partnership for modeling the marine
environment of the Puget Sound
and

Project ENVVEST
A partnership for improving the environmental
quality of Sinclair and Dyes Inlets

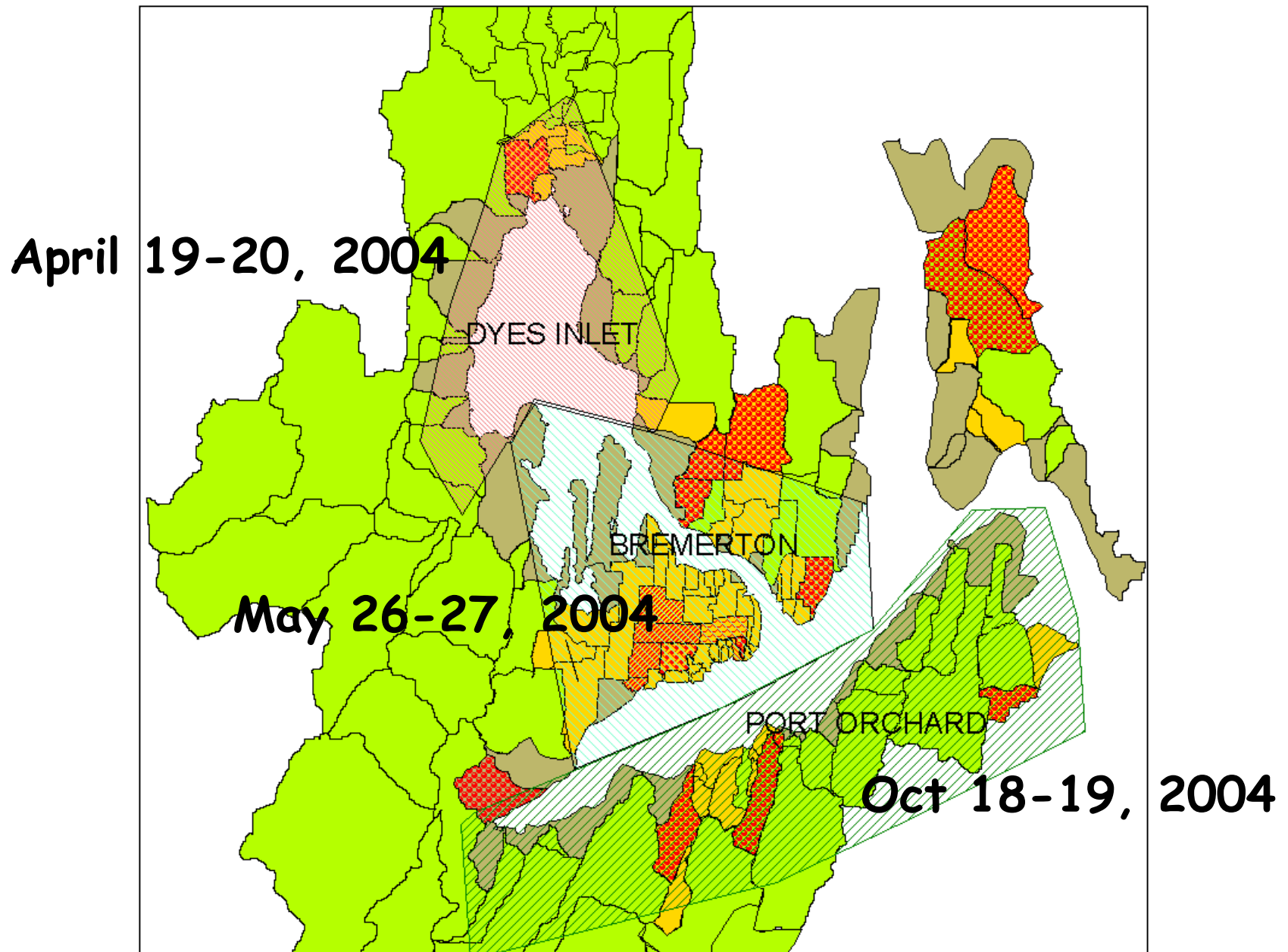
1



Fecal Coliform Modeling Results

Simulate all sources
Treatment Plants
Streams
Storm Water
Shoreline Drainage
Verify Model Prediction

Focus Areas For Model Verification

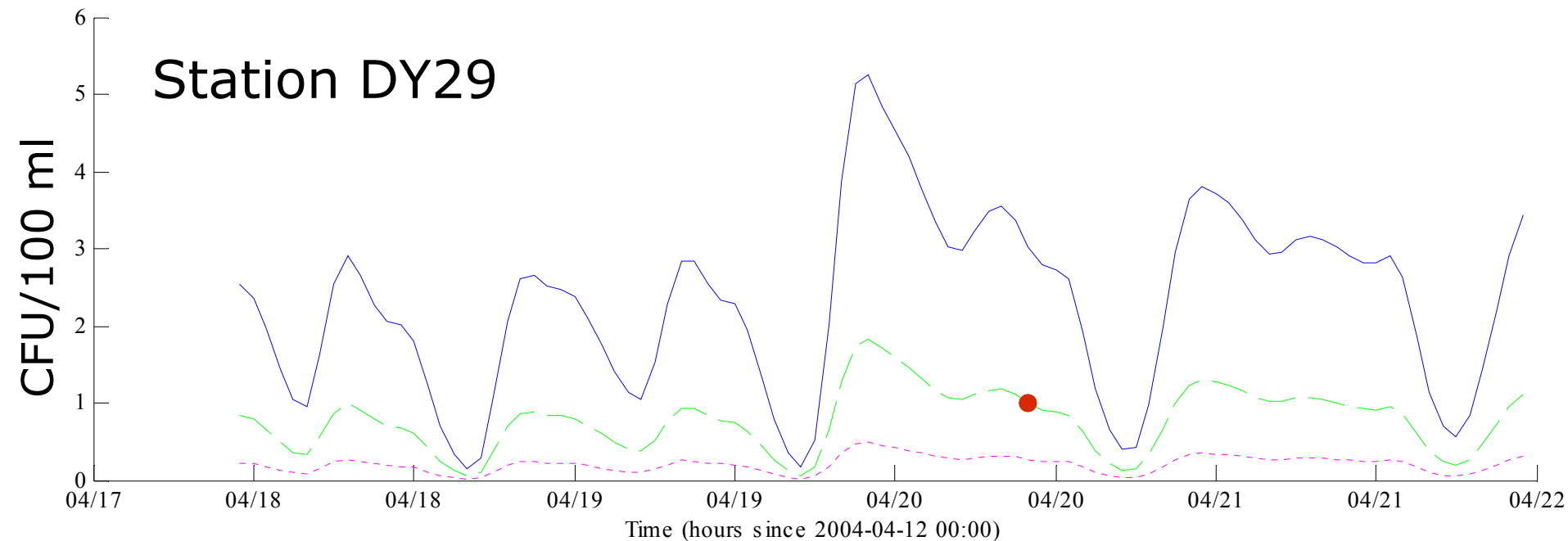


Comparing Model Results to Field Data

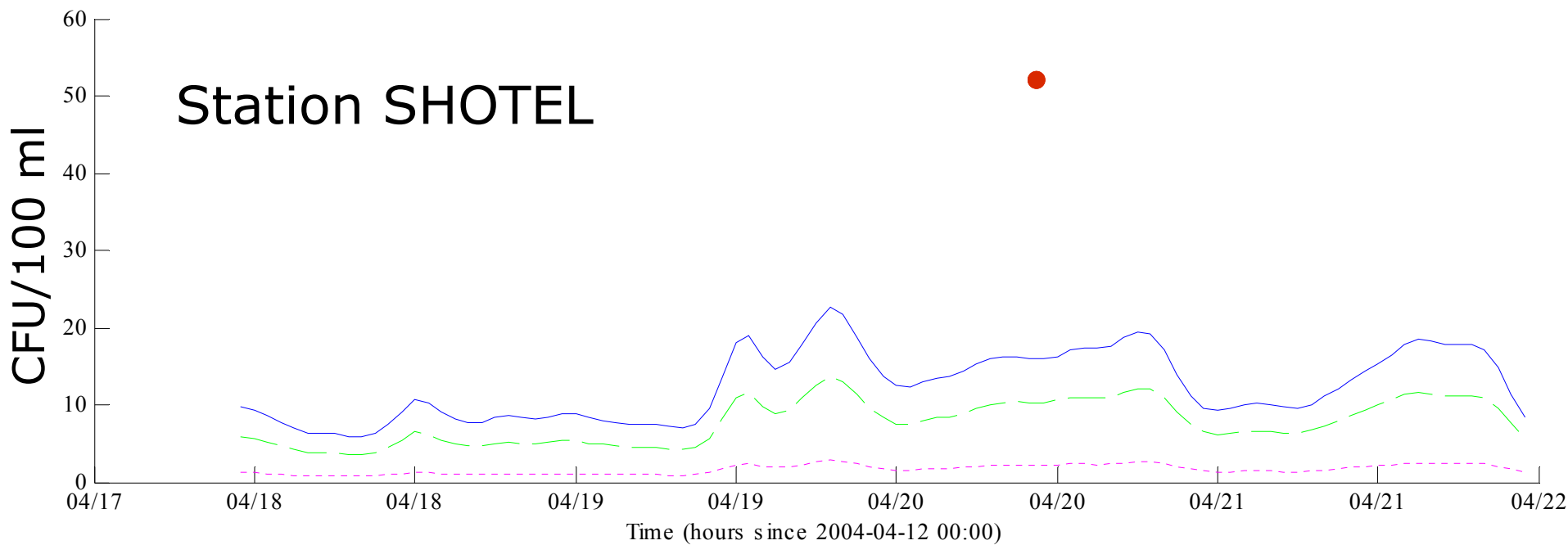


April 2004

Station DY29



Station SHOTEL



Next Steps for FC Modeling

- Complete evaluation of model verification results
- Simulate complete trace for Water Year 2003 (Oct 1, 2002 – Sep 30, 2003)
- Identify critical conditions for FC loading
- Design modeling scenarios for TMDL
- Complete modeling reports

Summary

Technical Studies are providing data needed to develop water cleanup plans for the Inlets

Modeling studies are providing better understanding of environmental issues

Partnering is helping to get a better product

For More Information:

Patricia
Hubler

Congressional & Public Affairs Office
Puget Sound Naval Shipyard & IMF
Phone: (360) 476-7111
Email: pao@psns.navy.mil

Douglas
Palenshus

Water Quality Program, Northwest Regional Office
WA Department of Ecology
Phone: (425) 649-7041
Email: dpal461@ecy.wa.gov